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This memoir—confined to a discussion of the anatomical characters, especially the structure of the gills, and to an arrangement of the different groups in conformity with the data newly obtained or now correlated by Dr. Ortmann—comprises an important advance in our knowledge of the fresh-water mussels. Giving full credit to Lea and Simpson, pioneers in the classification of these animals on the basis of the characteristics of the reproductive organs and marsupium, the author's studies of the microscopic structure of these organs have enabled him to rectify some errors and add very largely to the available data. The details are well illustrated both by text figures and excellent plates. The description and illustration of the Pennsylvanian species is reserved for future publication.

Dr. Ortmann, on account of certain archaic features, proposes for *Magaritana* a separate family, retaining the other Pennsylvanian forms in the Unionidæ which he divides into three subfamilies. He proposes a new genus *Paraptera* for *Lampsilis gracilis* (Barnes) on account of peculiarities of the glochidia. We note that he adopts for the group commonly known as *Glabaris* the name of *Anodontites* which was first applied by Bruguière. This name is undoubtedly prior to any other for the group in question, but by the rules in vogue, at the time it was proposed the termination *ites* was reserved for fossil species, and it was therefore not adopted. If *Anodontites* be rejected *Patularia* Swainson precedes *Glabaris* in date.

WM. H. DALL

The Sources and Modes of Infection. By CHARLES V. CHAPIN, M.D., Sc.D., Superintendent on Health, Providence, R. I., author of *Municipal Sanitation in the United States*. New York, John Wiley and Sons; London, Chapman and Hall, Limited. Octavo. Pp. ix + 399. 1910.

Any book written by this author is worthy of attention, and this one especially so—for in it is contained a summary of our knowledge of the subjects of which it treats and the interpretation put upon this knowledge by one

possessed of wide experience. Some of the conclusions arrived at will be startling to those unfamiliar with the general trend of modern thought, but none are put forward that are not logically in sequence to the evidence presented. It will be difficult to secure general acceptance of such conclusions as this (p. 28): "While municipal improvements, such as the above" (cleaning of streets, back alleys, etc., regulation of offensive trades and prevention of nuisances generally), "are advisable, there is little more real reason why health officials should work for them, than there is that they should work for free transfers, cheaper commutation tickets—all good things in their way and tending towards comfort and health." Yet the author brings forward apparently good evidence to show that such statements are warranted. Perhaps the most valuable chapter is the second—in which stress is laid upon "carriers and missed cases" as most important sources of infection. Attention is called to the great influence of infection by contact—the comparative slight importance of infection by fomites or by air; instances are given of the favorable results following the abandonment of disinfection in certain of the infectious diseases in Providence, and a proper amount of stress is laid upon the transmission of certain diseases by insects. For all who are interested in these subjects the book will be a valuable aid in recognizing the present evidence upon which the control of infectious diseases must rest.

HAROLD C. ERNST

HARVARD MEDICAL SCHOOL

BOTANICAL NOTES

A READABLE BOOK

AMONG the most readable of recent botanical books is that on "The Evolution of Plants," by President D. H. Scott, of the Linnean Society of London (New York, Holt). In about two hundred and fifty duodecimo pages the author discusses the evolution of plants most entertainingly and lucidly, confining himself, however, to the flowering plants and the "higher spore plants."

The scope of the work may be appreciated from the chapter headings, which include a discussion of the Darwinian theory, the nature of the evidence, the fossil record, the problem and the evidence in regard to seed plants, evolution of ferns, club-mosses, horse-tails and sphenophylls. There is a handy glossary for the non-botanical reader, and a brief bibliography.

We may close this brief notice by quoting a paragraph from the author's "conclusions" (p. 29):

The first and most obvious result of our inquiries is to prove the enormous antiquity of highly-organized plants. If a botanist were set to examine, without prejudice, the structure of those Devonian plants which have come down to us in a fit state for such investigation, it would probably never occur to him that they were any simpler than plants of the present day; he would find them different in many ways, but about on the same general level of organization. Within the period from the Devonian age to our own time organization is not shown to have "largely advanced," though there have been many changes. It is not contended that there has been no advance; the special adaptations of the Flowering Plants to Insect life and in other ways show progress in many directions, corresponding to increased complexity in the conditions of life. It must be borne in mind, however, that we know very little as yet about such special adaptations among plants of earlier periods.

A NEW TEXT-BOOK OF BOTANY

NINE years ago Professor Dr. Henry Kraemer brought out the first edition of a book under the title of "A Text-book of Botany and Pharmacognosy" which the present reviewer was glad to commend as an effort to secure a better botanical foundation for students of pharmacy. Since then two editions have appeared (1907, 1908) and now we have a fourth edition (Lippincott, 1910) much enlarged and improved. The plan of the work remains practically the same as in the earlier editions. Part I. is devoted to botany and includes chapters on the principal groups of plants, the outer morphology of angiosperms, the inner morphology of the higher plants,

classification of angiosperms yielding vegetable drugs, and cultivation of medicinal plants. In looking over this portion of the book, which covers more than 400 pages, the botanist is struck with the fact that at last the medical men of America have awakened to the fact that the botanical foundation for their students must be broad and solid. The treatment in this portion of the book is so entirely different from that which has too often been given to medical students that there is no similarity whatever. It is very good indeed and the author is to be congratulated upon his interpretation of the methods of the modern study of pharmacy.

Part II., covering about 300 pages, is devoted to pharmacognosy and includes two chapters, the first and longest being devoted to crude drugs and the second to powdered drugs and foods. The remaining parts, which include about 50 pages, are devoted to reagents and technique and micro-analysis.

The author has a keen sense of the need of the particular treatment which he has given the subject, as is shown by his statement that "while there are some teachers who naturally prefer their students to have an independent course in botany before taking up pharmacognosy, the treatment of this subject in this book is such as to be directly applicable to pharmaceutical work, and will be found useful to the student of pharmacy in the college course, as well as of assistance to the pharmacist and analyst who engages in practical pharmacognostical work." With this statement the present reviewer most heartily agrees. In fact, he has looked over these earlier chapters and has wondered whether the purely botanical portion would not be a most excellent text-book in botanical laboratories. Certainly in this day when we are trying to relate our sciences more and more to their applications, the treatment here is most suggestive and commendable.

Dr. Kraemer has introduced an interesting feature in his study of drugs in suggesting simple methods by which the crystalline extracts may be obtained by the student. This, no doubt, will add very greatly to the interest

of the study and is a feature to be greatly commended.

CHARLES E. BESSEY

UNIVERSITY OF NEBRASKA

SPECIAL ARTICLES

PROGRESSIVE VARIATION IN DECAPTERUS, A GENUS OF CARANGOID FISHES

IN the fishes of the genus *Decapterus* which the writer has examined here and abroad, six forms are recognizable, making a series from species which perhaps belong rather to *Caranx*, to the most extreme *Decapterus*. Typical *Decapterus* departs from the *Caranx* type in being less deep, less compressed, in having the last ray of the dorsal and anal fins separate from the rest of the fin, forming a mackerel-like finlet, and in possessing a bluntly pointed protuberance with a groove beside it, on the shoulder girdle under the edge of the gill cover, suggesting a not dissimilar structure in *Trachuroops*, but less pronounced. The most *Caranx*-like of the six is *Decapterus affinis* of the Pacific and Indian Oceans. The four middle forms are intermediates between this and the least *Caranx*-like, *D. macarellus*. This progressive variation is readily explicable by a very attractive theory of variation with migration, submitted for what it is worth.

The six forms are:

1. *D. affinis* (Rüppel). Figured by Day ("Fauna British India, Fishes") and Jordan and Seale ("Fishes of Samoa," *D. lundini*). Specimens have been examined in the British Museum.

Depth 3.5 in length to fork of caudal. Anal soft rays 20-22. Lateral line with 50-53 scales followed by 42-47 scutes. Last ray of dorsal and anal not detached from the rest of the fin. Teeth small, evident.

Range—Pacific and Indian Oceans.

2. *D. rhonchus* (G. St.H.). A specimen examined in the Paris Museum.

Depth 4.0. Anal soft rays 25-27. 56 scales followed by 23-26 scutes in the lateral line. Last ray of dorsal and anal not detached. Teeth small, evident. Without the peculiar shoulder structure mentioned above.

Range—north and west coasts of Africa.

3. *D. maru-adsii* (Temminck & Schlegel). A specimen examined in the Paris Museum. Cat. Fish, Brit. Mus. II.

Depth 4.5. Anal rays 28. 50 scales followed by 36 scutes in lateral line. Last rays dorsal and anal detached from the remainder of the fin. Teeth minute, evident. With the peculiar shoulder structure.

Range—Japan and China coasts.

4. *D. kurra* (Cuv. & Val.). Day, Fauna British India, Fishes. The type of *D. kiliche*, C. & V., examined in the Paris Museum.

Depth 5.0. Anal rays 26. 47-55 scales followed by 33 scutes in lateral line. Last rays dorsal and anal detached. Teeth minute, evident. Peculiar shoulder structure present.

Range—Indian Ocean.

5. *D. punctatus* (Ag.). Specimens examined in the Paris Museum labelled *D. punctatus* and *D. kurroides*. Bull. 47, U. S. National Museum.

Depth 5.0. Anal rays 25. 56 scales followed by 32 scutes. Last dorsal and anal rays detached. Teeth minute, evident. Peculiar shoulder structure present.

Range—Atlantic Ocean.

6. *D. macarellus* (Cuv. & Val.). Types of *D. macarellus*, *pinnulatus*, *jacobæus* and *scombrinus*, examined in the Paris Museum. *D. macarellus* and *D. sanctæ-helenæ*, Bull. 47, U. S. National Museum.

Depth 5.5-6.0. Anal rays 28-31. 94-96 scales followed by 28-30 scutes. Last dorsal and anal rays detached. Teeth not evident. Peculiar shoulder structure present.

Range—Atlantic and Pacific Oceans.

Nos. 1 and 2 of this series would perhaps fit better in *Caranx* than in *Decapterus* (being more or less intermediate between *C. djedaba* and the genus *Decapterus*). Specimens of *rhonchus* and *maru-adsii* placed side by side resembled one another very much, the most noticeable differences being the imperfectly separated last dorsal and anal rays, and absence of shoulder peculiarity in *rhonchus*. *Punctatus* is much less compressed than *maru-adsii*, and *kurra* intermediate between these two as is its range. These three